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EP 0164909 A2

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(54) Child safety-seat for vehicle

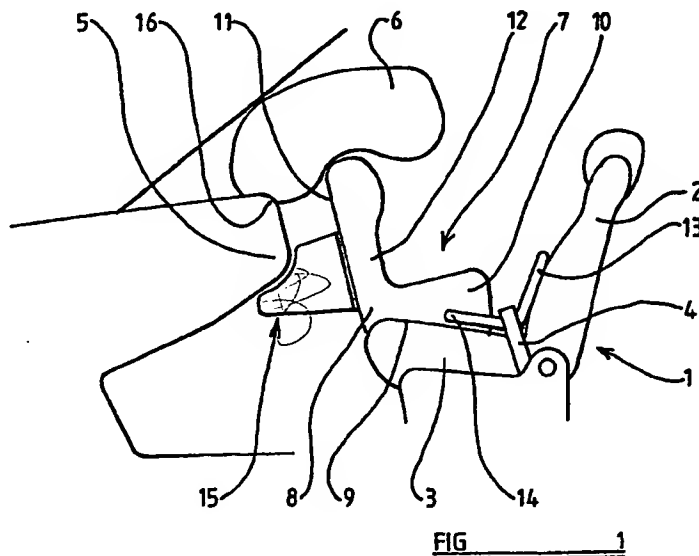
(57) A child's safety-seat 7, to be positioned, rearward-facing, on the front passenger seat squab 3, of a motor vehicle comprises:

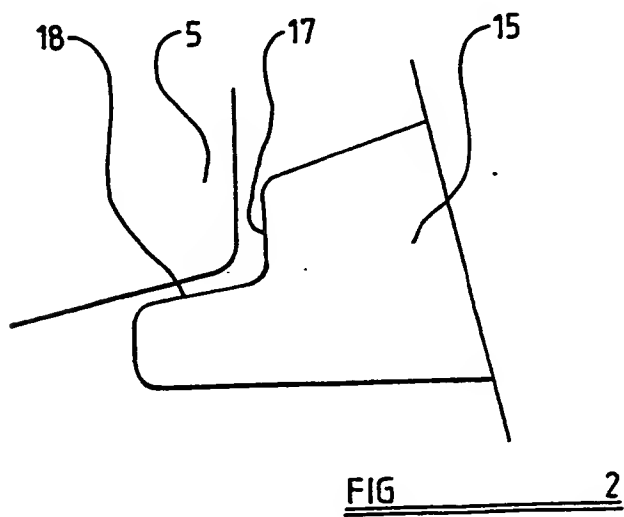
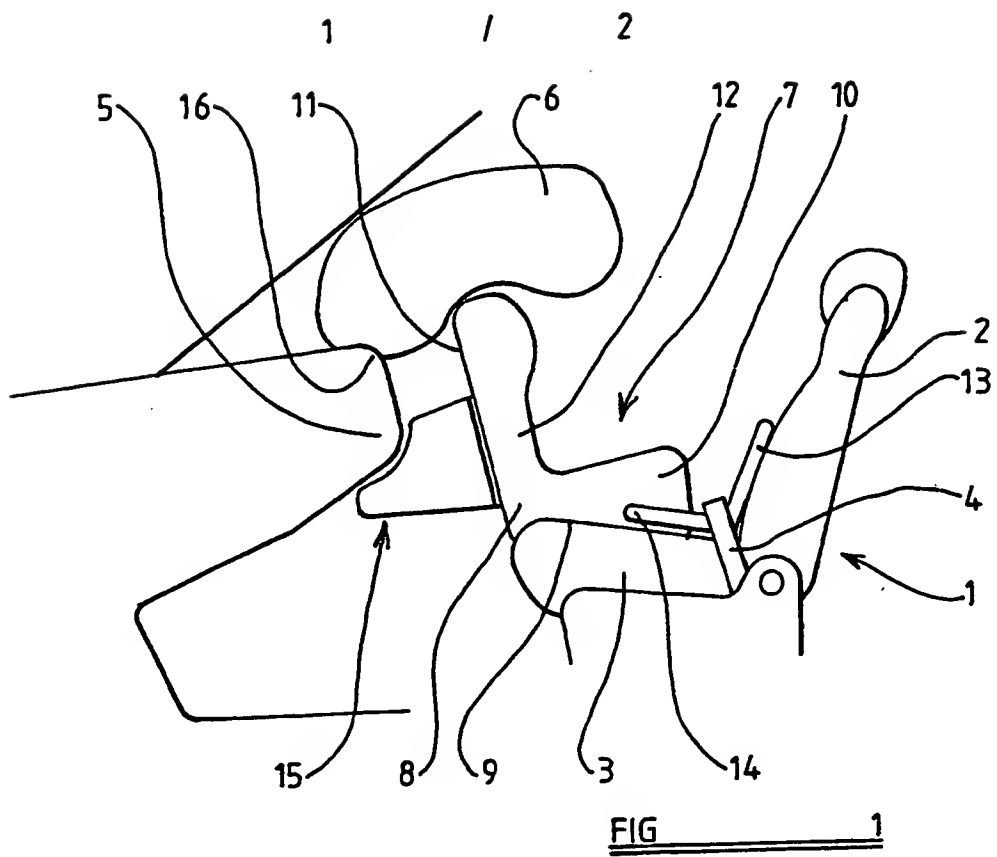
(a) a seat portion 10,

(b) a back portion 12 and

(c) means to retain the child in the seat,

the back portion including a rear projection 15 adapted to engage part of the vehicle so as to space the back of the seat from the dashboard 5, of the vehicle to stop the seat riding up in use. The arrangement may be such as to permit inflation of an air bag 6, without interference from the seat. An alternative rear projection (Fig 3) also engages the dash board and rests on the floor of the vehicle.





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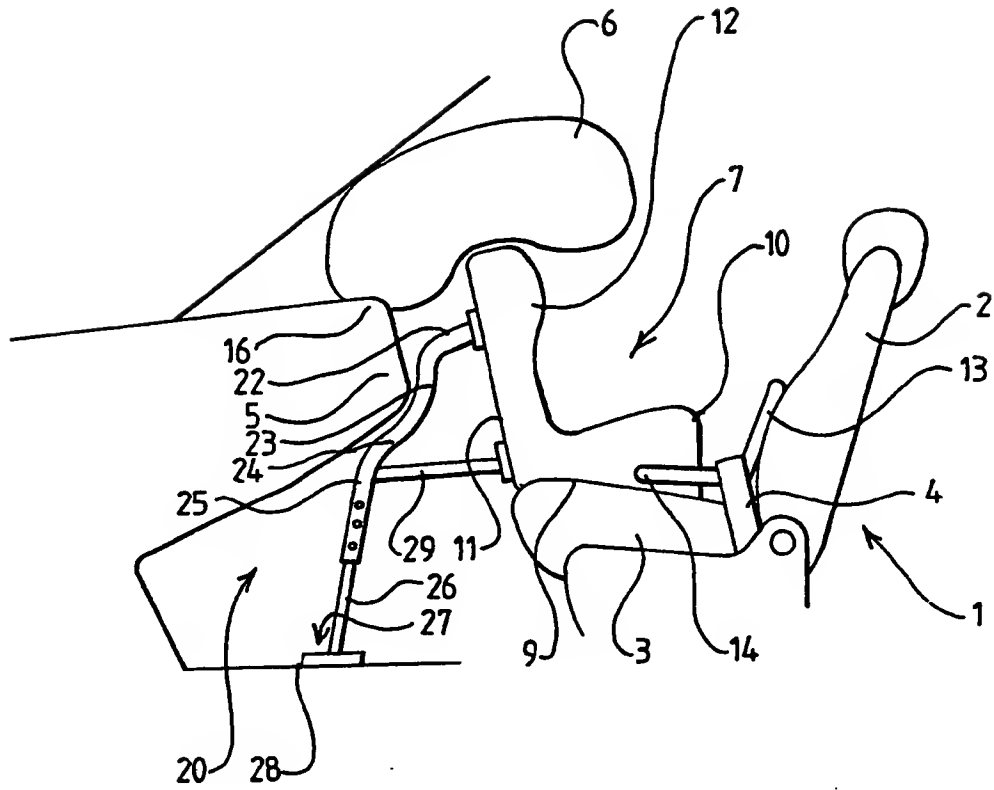


FIG 3

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DESCRIPTION OF INVENTION

"IMPROVEMENTS IN OR RELATING TO A CHILD SAFETY-SEAT"

THE PRESENT INVENTION relates to a child safety-seat and more particularly relates to a child safety-seat for use in a motor vehicle.

Various designs of child safety-seat for use in a motor vehicle have been proposed previously. Most of these child safety-seats incorporate a substantially rigid shell which defines the seat and which is provided with safety straps to retain the child in the safety-seat, the shell being associated with means to enable the shell to be mounted securely in position in the motor vehicle. In certain embodiments of prior proposed safety-seat the shell has been so designed that the child safety-seat may be best positioned on the squab of a front passenger seat in the motor vehicle, so that the child, in the child safety-seat, is facing rearwardly. In such an arrangement the back of the child safety-seat typically rests on or is located extremely close to the dashboard of the vehicle in the region in front of the passenger seat on which the safety-seat is located.

Many cars are now provided with so-called "air-bags" which are adapted to be inflated, in the event that an accident arises, in order to provide a degree of protection for the driver and for the front-seat passenger of the vehicle. Typically such an "air-bag" is contained

initially within a recess present in the dashboard in front of the front passenger seat.

It has been found that if a child safety-seat of the type described above is in position in a car which is provided with an air-bag of this type, if the air-bag inflates, due to an accident arising, the air-bag may propel the child safety-seat rearwardly with such a force that a child strapped in the safety-seat becomes ejected from the safety-seat. The child may be severely injured.

The present invention seeks to provide an improved child safety-seat.

According to this invention there is provided a child safety-seat for use in a motor vehicle, on a front passenger seat of the vehicle, with the safety-seat facing rearwardly, the child safety-seat comprising a shell defining a seat portion to accommodate the posterior of a child and a back portion to engage the back of a child, the shell being provided with means adapted to retain a child in position in the safety-seat, the rear of the back of the safety-seat being provided with projecting means adapted to lie adjacent or engage the front part of the dashboard of a motor vehicle when the safety-seat is positioned on the squab of the front passenger seat of the vehicle, to ensure a minimum distance between the back of the safety-seat and the dashboard of the vehicle with the safety-seat facing rearwardly, part of the projecting means being adapted to extend under the dashboard to prevent movement of the child safety-seat upwardly and away from the dashboard.

According to another aspect of this invention there is provided a child safety-seat provided in a motor vehicle, the child safety-seat comprising a shell mounted

in a rearwardly facing position on a forwardly facing front seat in the motor vehicle, the shell defining a seat portion to accommodate the posterior of a child and a back portion to engage the back of a child, the shell being provided with means adapted to retain the child in position in the safety-seat, the rear of the back of the safety-seat being provided with projecting means which engage part of the vehicle to maintain the child safety-seat in a position such that the back of the child safety-seat is spaced from part of the dashboard in the motor vehicle accommodating an air-bag or the like.

Preferably part of the projecting means are adapted to lie under the dashboard to prevent rotation of the child safety-seat upwardly and away from the dashboard.

Conveniently the said projecting means are adapted to retain the back of the safety-seat at a distance of at least 150 mm from the dashboard of the vehicle.

Preferably the projecting means comprise one or more elements which extend from the back of the safety-seat, adapted to engage the front of the dashboard and defining a portion adapted to extend under part of the dashboard.

Advantageously the projecting means comprise one or more elements extending from the rear of the back of the safety-seat and provided with a foot adapted to engage the floor of the motor vehicle.

Preferably the foot is adjustable.

Conveniently the adjustment of the foot is a telescopic adjustment of the foot.

Preferably the foot is associated with an over-dead-centre mechanism to secure the child safety-seat in position.

Conveniently the projecting means are detachably connected to the child safety-seat.

Preferably the safety-seat is provided with an element adapted to project forwardly of the safety-seat, and having an upwardly extending terminal portion positioned to engage the front face of the rear of the front passenger seat of the vehicle when the child safety-seat is in position.

Conveniently the projecting element comprises a pivotally mounted handle adapted for use in carrying the safety-seat.

In order that the invention may be more readily understood, and so that further features thereof may be appreciated, the invention will now be described, by way of example, with reference to the accompanying drawings in which

FIGURE 1 is a diagrammatic side elevational view of part of a motor car provided with a child safety-seat in accordance with the invention,

FIGURE 2 is an enlarged view illustrating a projection on a child safety-seat engaging a dashboard, and

FIGURE 3 is a view corresponding to Figure 1 illustrating a modified embodiment.

Referring to Figures 1 and 2, a front passenger seat 1 in a motor vehicle is provided with a back 2 and a squab 3. A safety-belt 4 is associated with the seat. The safety belt may be mounted directly on the vehicle.

The seat 1 is located spaced from a dashboard 5 which may be of any convenient design, the dashboard containing an air-bag 6 illustrated in the inflated form.

A child safety-seat 7 is provided comprising a rigid shell 8, the shell being of substantially conventional form. The shell 8 provides a substantially horizontally extending seat portion 9 having, at each side, an upstanding "wing" 10, the portion 9 being adapted to accommodate the posterior of a child. The shell 8 also defines an upwardly inclined "back" portion 11, again associated with forwardly extending wings 12 at each side, the back of the child being intended to lie against the "back" portion 11 of the seat. Safety straps (not shown) are provided mounted on the shell 8 to retain a child in position in the seat.

The child safety-seat 7 is provided with a cranked handle 13 pivotally connected, at point 14, to the side of the child-seat. The handle 13 is shown in a position where part of the handle extends substantially horizontally parallel with the upper surface of the squab 3 of the seat 1 and a terminal portion of the handle extends upwardly adjacent the front of the back 2 of the seat 1. The safety-belt 4 associated with the seat 1 passes across the cranked part of the handle 13, thus assisting in retaining the child-seat in position on the squab 3 of the seat 1. (The handle 13 may be moved pivotally, about the point 14, to a substantially vertical position, and the handle may then be used to carry the seat 7). In

alternative embodiments the safety-belt 4 may pass across the tops of the wings 10 that form the sides of the child-seat, the wings 10 being provided with recesses in their upper edges to receive the belt.

A projection 15 is provided detachably mounted on the rear face of the "back" portion 11 of the child safety-seat 7, the projection thus extending forwardly of the motor vehicle and engaging part of the dashboard 5 at a position below the point 16 at which the air-bag 6 emerges from the dashboard. The projection 15 may have a width substantially equal to the width of the child safety-seat 7 or, in a modified embodiment, may comprise two projections of similar form each located at one side of the child safety-seat.

The projection 15 may be of the form illustrated in Figure 2, and may thus have a vertical face 17 to engage the front face of the dashboard, and an upwardly directed face 18 adapted to be located beneath the dashboard to engage the under-surface of the dashboard.

The primary purpose of the projection 15 is to space the back 10 of the child safety-seat 7 from the point 16 at which the air-bag 6 emerges from the dashboard 5, the preferred spacing being at least 150 mm.

The child safety-seat 7 will initially be mounted in position on the squab 3 of the adult seat 1, and will be partly retained in position by means of the safety-belt 4 passing across the cranked part of the handle 13, or across the wings 10. The seat 1 will then be moved forwardly, within the permitted adjustment of the seat, so that the projection 15 engages the dashboard 5 as illustrated. The child safety-seat is thus effectively gripped between the

dashboard and the back 2 of the seat 1. Part of the seat-belt associated with the seat 1 may also pass across the rear of the "back" portion 10 of the child-seat 7 thus assisting in firmly retaining the child-seat 7 in position.

It is to be noted that if the motor vehicle in which the child safety-seat 7 is fitted is involved in a front impact, the child safety-seat will not move forwardly because of the engagement of the back of the seat 10 with the part of the safety-belt which surrounds the back 10 of the seat, and because of the engagement of part 4 of the safety-belt with the cranked part of the handle 13. Also the projection 15, the face 17 of which engages the dashboard 5 will help prevent movement of the seat in the direction of travel of the motor vehicle. Because, however, the back 11 of the seat is spaced from the point 16 at which the air-bag 6 emanates from the dashboard 5, if the air-bag is inflated, the air-bag will be able to inflate in the available space.

If the motor vehicle in which the seat is fitted is involved in a rear collision, the seat 7 will not tend to pivot towards the rear of the vehicle, firstly because the cranked part of the handle 13 that engages the front of the back 2 of the seat 1 terminates at a point which is located above the centre of gravity of a child present within the seat 7. Thus any motion applied to the seat will tend to be a rotary motion about a point defined by the terminal part of the handle 13, that motion being, as can be understood by considering the figure, in an anti-clockwise direction. Also it is to be noted that the part of the projection 15 which underlies part of the dashboard 5 and defines the surface 18 as shown in Figure 2 will tend to prevent motion of the child-seat 7 in a clockwise sense. This part of the projection 15, together with the seat-

belt 4 also serves to prevent the child-seat being pivoted undesirably when the air-bag is inflated, since the air-bag may engage the back 10 of the child safety-seat.

Reference is now made to Figure 3, which corresponds broadly with Figure 1, but which illustrates a modified embodiment of the invention. The reference numerals used in Figure 3 are the same as those used in Figure 1 for corresponding parts, and these parts will not be re-described.

In the embodiment of Figure 3 the projection 15 of the embodiment of Figures 1 and 2 has been replaced by a rearwardly projecting assembly 20 which extends from the rear of the back 11 of the child safety-seat 7. The assembly 20 consists of an upper tubular element which is connected to an upper point on the rear of the back 11 of the seat 7, and has a first horizontal tubular portion 22, a further tubular portion 23 which extends substantially vertically downwardly adjacent the front of the dashboard 5, which merges into an inclined tubular portion 24 which extends underneath the dashboard 5. The tubular portion 24 terminates in a downwardly extending tubular portion 25 which telescopically receives a leg 26 carrying a foot 27 adapted to engage the floor 28 of the motor vehicle at a position in front of the seat 1. A substantially horizontally extending reinforcing strut 29 is provided which extends from the point of connection of the tubular portion 24 and the tubular portion 25 to a lower point on the rear face of the back 11 of the seat 7.

The projecting assembly 20 may be detachably connected to the back of the seat 7, but it is to be observed, from Figure 3, that when the assembly is mounted on the back of the seat 7 and is positioned with the

foot 28 telescopically adjusted so that it touches the floor 28 and supports the child safety-seat 7, the back of the child safety-seat 7 is located at a desired spacing in front of the point 16 on the dashboard 5 at which the air-bag 6 emerges from the dashboard when it is inflated. Also, it is to be noted that the tubular portion 24 lies under part of the dashboard 5, and will engage the dashboard if the seat 7 begins to move with a clockwise movement.

Consequently, it is to be appreciated that in the embodiment of Figure 3, the child safety-seat is mounted in a desired position, with the back of the seat spaced away from the dashboard 5, thus permitting easy inflation of the air-bag 6 without any undesirable consequential movement of the child safety-seat 7. Also, the projecting assembly 20, although not necessarily directly touching the dashboard 5, will prevent any significant movement of the child safety-seat towards the dashboard (when the tubular portion 23 will engage the front of the dashboard thus preventing further movement) or rotationally in a clockwise sense as illustrated (when the tubular portion 24 will engage the underside of the dashboard, thus preventing any further movement).

The embodiment of Figure 3 may be further modified to make the leg supporting the foot an "over-dead-centre" arrangement to lock the child safety-seat in position, effectively squeezed between the dashboard 5 and the seat 1.

Whilst the invention has been described with reference to preferred embodiments it is to be appreciated that many modifications may be effected to the described

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embodiments without departing from the scope of the invention.

CLAIMS:

1. A child safety-seat for use in a motor vehicle, on a front passenger seat of the vehicle, with the safety-seat facing rearwardly, the child safety-seat comprising a shell defining a seat portion to accommodate the posterior of a child and a back portion to engage the back of a child, the shell being provided with means adapted to retain a child in position in the safety-seat, the rear of the back of the safety-seat being provided with projecting means adapted to lie adjacent or engage the front part of the dashboard of a motor vehicle when the safety-seat is positioned on the squab of the front passenger seat of the vehicle, to ensure a minimum distance between the back of the safety-seat and the dashboard of the vehicle with the safety-seat facing rearwardly, part of the projecting means being adapted to extend under the dashboard to prevent movement of the child safety-seat upwardly and away from the dashboard.

2. A child safety-seat provided in a motor vehicle, the child safety-seat comprising a shell mounted in a rearwardly facing position on a forwardly facing front seat in the motor vehicle, the shell defining a seat portion to accommodate the posterior of a child and a back portion to engage the back of a child, the shell being provided with means adapted to retain the child in position in the safety-seat, the rear of the back of the safety-seat being provided with projecting means which engage part of the vehicle to maintain the child safety-seat in a position such that the back of the child safety-seat is spaced from part of the dashboard in the motor vehicle accommodating an air-bag or the like.

3. A child safety-seat according to Claim 1 or 2 wherein part of the projecting means are adapted to lie under the dashboard to prevent rotation of the child safety-seat upwardly and away from the dashboard.

4. A child safety-seat according to Claim 1, 2 or 3 wherein the said projecting means are adapted to retain the back of the safety-seat at a distance of at least 150 mm from the dashboard of the vehicle.

5. A child safety-seat according to any one of the preceding Claims wherein the projecting means comprise one or more elements which extend from the back of the safety-seat, adapted to engage the front of the dashboard and defining a portion adapted to extend under part of the dashboard.

6. A child safety-seat according to any one of Claims 1 to 4 wherein the projecting means comprise one or more elements extending from the rear of the back of the safety-seat and provided with a foot adapted to engage the floor of the motor vehicle.

7. A child safety-seat according to Claim 6 wherein the foot is adjustable.

8. A child safety-seat according to Claim 7 wherein the adjustment of the foot is a telescopic adjustment of the foot.

9. A child safety-seat according to any one of Claims 6 to 8 wherein the foot is associated with an over-dead-centre mechanism to secure the child safety-seat in position.

10. A child safety-seat according to any one of the preceding Claims wherein the projecting means are detachably connected to the child safety-seat.

11. A child safety-seat according to any one of the preceding Claims wherein the safety-seat is provided with an element adapted to project forwardly of the safety-seat, and having an upwardly extending terminal portion positioned to engage the front face of the rear of the front passenger seat of the vehicle when the child safety-seat is in position.

12. A child safety-seat according to Claim 11 wherein the projecting element comprises a pivotally mounted handle adapted for use in carrying the safety-seat.

13. A child safety-seat substantially as herein described with reference to and as shown in Figures 1 and 2 of the accompanying drawings.

14. A child safety-seat substantially as herein described with reference to and as shown in Figure 3 of the accompanying drawings.

15. A motor vehicle provided with a child safety-seat according to any one of the preceding Claims.

16. Any novel feature or combination of features disclosed herein.

Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

- 14 -

Application number

GB 9222752.9

Relevant Technical fields

(i) UK CI (Edition L) A4L (LAAR, LAL, LBEP, LBEQ)

(ii) Int CI (Edition 5) B60N 2/26

Databases (see over)

(i) UK Patent Office

(ii)

Search Examiner

J E FULCHER

Date of Search

11 DECEMBER 1992

Documents considered relevant following a search in respect of claims 1-15

| Category (see over) | Identity of document and relevant passages | Relevant to claim(s) |
|------------------------|---|-------------------------|
| A | EP 0164909 A2 (ASE (UK)) Figure 2 in particular | 6 |

| Category | Identity of document and relevant passages - 15 - | Relevant to claim(s) |
|----------|--|----------------------|
| | | |

Categories of documents

X: Document indicating lack of novelty or of inventive step.

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